REMARKS/ARGUMENTS

The Pending Claims

Claims 1-37, 39-55, 59, and 64-77 are pending.

Amendments to the Claims

The claims have been amended to point out more particularly and claim more distinctly the invention. In particular, claims 3, 18, 37, and 47 have been amended to refer to a variant of an antiviral protein comprising SEQ ID NO: 1 or nucleic acid encoding the protein, wherein the variant comprises 5 or fewer conservative or neutral amino acid substitutions and/or 1, 2, or 3 amino acid additions at the N-terminus and/or C-terminus, as supported by the specification at, for example, page 9, paragraph 0025. Claims 37 and 47 also have been amended to recite the features of claim 38 (now canceled). Claim 52 has been amended to be an independent claim. Claims 57, 58, and 60-63 have been canceled. No new matter has been added by way of these amendments.

Summary of the Office Action

The Office rejects claims 1, 3-16, 18-46, 55, and 57-77 under 35 U.S.C. § 112, first paragraph, as allegedly lacking written description. The Office rejects claims 37, 41-51, 64-73, 76, and 77 under 35 U.S.C. § 112, first paragraph, as allegedly lacking enablement.

The Office rejects claims 52 and 55 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. 6,183,961. The Office rejects claims 52-55 and 57-62 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. 6,193,982 in view of Ziolkowska et al. (*Acta Biochim Pol, 53:* 617-626 (2006).

The Office rejects claims 52-55 and 57-62 on the grounds of nonstatutory obviousness-type double patenting as allegedly unpatentable over claims 1-6 of U.S. Patent No. 6,193,982 in view of Ziolkowska et al.

The Office objects to claims 2, 17, 53, and 54 as depending from a rejected base claim.

Reconsideration of these objections and rejections is hereby requested.

Discussion of the Written Description Rejections

The Office rejects claims 1, 3-16, 18-52, 55, and 57-77 because the specification allegedly has inadequate written description support for the antiviral variants and fragments of SEQ ID NO: 1 and the use thereof.

Claim 1 recites an amino acid sequence that is at least 90% identical/homologous to SEQ ID NO: 1 or fragments thereof. Since the amino acid sequence of scytovirin is 95 amino acids in length, a variant that has at least 90% identity/homology contains 9 or fewer amino acid residue changes. The specification describes such proteins at, for example, page 8, paragraph 0023.

Similarly, claims 3, 18, 37, and 47, as amended, recite a variant of the antiviral protein comprising the amino acid sequence of SEQ ID NO: 1, or of the nucleic acid encoding the amino acid sequence of SEQ ID NO: 1, wherein the variant comprises 5 or less conservative or neutral amino acid substitutions and/or 1, 2, or 3 amino acid additions at the N-terminus and/or C-terminus. The specification describes such variants at, for example, page 9, paragraph 0025; and page 14, paragraph 0043.

The specification describes that scytovirin shows strong internal sequence duplication (see, for example, page 40, paragraph 00129). When amino acids 1-48 and 49-95 of SEQ ID NO: 1 are aligned, 36 residues (78%) are identical and 2 (4%) represent conservative amino acid changes (Fig. 2). Thus, the specification suggests regions within scytovirin and fragments thereof that are necessary (and, thus, should be conserved) to retain scytovirin's antiviral activity. Accordingly, based on the description in the specification, one of ordinary skill in the art would have recognized that the inventors were in possession of the claimed invention.

The Office contends that there is insufficient descriptive support for the antibody and method of claims 57 and 61, respectively. Claims 57 and 61 (and claims depending therefrom) have been canceled, rendering the rejection moot as to these claims.

For the above-described reasons, the pending claims are fully described by the specification. Therefore, Applicants request that the written description rejection be withdrawn.

Discussion of the Enablement Rejections

The Office contends that the application is not enabling for the use of the claimed composition to inhibit infection by *any* virus as recited in claims 37, 41-51, 64-73, 76, and 77. Claims 37 and 47 have been amended to recite the features of claim 38, which claim was not rejected for lack of enablement. Accordingly, Applicants assert that claims 37 and 47, and claims 41-46, 48-51, 64-73, 76, and 77 dependent thereon, are enabled by the application.

The Office contends that claims 60-63 are not enabled by the application. Applicants disagree with this rejection. However, to expedite prosecution, claims 60-63 have been canceled.

Therefore, Applicants request that the enablement rejections be withdrawn.

Discussion of the Anticipation Rejections

The Office contends that claim 1, from which claim 52 depends, encompasses proteins comprising SEQ ID NO: 1, as well as fusions of the polypeptide to a tag, such as FLAG. The Office therefore considers that claims 52 and 55, directed to an antibody that binds the protein of claim 1, are anticipated by references that disclose antibodies that bind to the FLAG sequence, such as U.S. 6,183,961.

Claim 1 has been amended to clarify that the antibody binds to SEQ ID NO: 1 or particular variants or fragments thereof. Therefore, antibodies that recognize the FLAG sequence, which is not part of SEQ ID NO: 1, cannot be considered to anticipate claims 52 and 55.

The Office contends that claims 52-55 and 57-62 are anticipated by U.S. 6,193,982 in view of Ziolkowska et al. In particular, the Office contends that since the cyanovirin disclosed in U.S. 6,183,961 and the scytovirin of the present invention both bind to carbohydrate moieties attached to the HIV gp120 glycoprotein, antibodies to cyanovirin would be able to bind to the scytovirin of the present invention. Applicants note that claims 57, 58, and 60-63 have been canceled. Thus, the rejection is addressed only with respect to remaining claims.

As set forth in Ziolkowska et al., cyanovirin and scytovirin bind to different regions of mannose-containing oligosaccharides present on the surface of viral envelope glycoproteins (see page 624, paragraph bridging columns 1 and 2). In particular, cyanovirin recognizes smaller oligosaccharide structures on the terminal branches of oligomannose-9 than scytovirin (see, e.g., Adams et al., *Chem. Biol., 11(6)*: 875-881 (2004). Cyanovirin has been shown to bind to α1-2, α1-2 linked trisaccharide portions of oligomannose-9, while the smallest portion of oligomannose-9 that scytovirin binds to is a α1-2, α1-2, α1-6 linked tetrasaccharide (see, e.g., Adams et al., *supra*). Since cyanovirin and scytovirin bind to different portions of the oligosaccharides, antibodies to cyanovirin would not be able to bind to scytovirin and vice versa.

For the above reasons, Applicants request that the anticipation rejections be withdrawn.

Discussion of the Obviousness-Type Double Patenting Rejection

The Office contends that claims 52-55 and 57-62 are unpatentable over claims 1-6 of U.S. 6,193,982 in view of Ziolkowska et al.

Claims 57, 58, and 60-63 have been canceled. As discussed above, cyanovirin and scytovirin bind to different portions of oligosaccharides, such that antibodies to cyanovirin would not bind to scytovirin and vice versa. Thus, the inventive antibodies that bind to scytovirin cannot be considered obvious in view of the anti-cyanovirin antibodies of claims 1-6 of U.S. 6,193,982.

For these reasons, Applicants request that the obviousness-type double patenting rejection be withdrawn.

Discussion of the Objection to the Claims

The Office objects to claims 2, 17, 53, and 54 as depending from a rejected base claim. Applicants believe that the rejections of the base claims from which claims 2, 17, 53, and 54 depend, have been overcome. Therefore, Applicants request that the objection to claims 2, 17, 53, and 54 be withdrawn.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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